



National Aeronautics and Space Administration  
Goddard Space Flight Center

Wallops Flight Facility, Wallops Island, Virginia

# Inside Wallops

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## ***NASA Prepares For First Scramjet-Powered Hypersonic Flight***

Imagine a new breed of space transportation vehicle, able to fly at seven times the speed of sound, using a next-generation air-breathing jet engine. NASA takes a hypersonic leap into the future of aerospace technology with the flight of the scramjet-powered X43A.

It will be the first time a non-rocket propelled, air-breathing engine has powered a vehicle in flight at hypersonic speeds, or five times the speed of sound. An aircraft moving at Mach 5 would travel about one mile per second, or about 3,600 mph at sea level, far faster than any air-breathing aircraft has ever flown.

Unlike a rocket that carries its own oxygen for combustion, the X-43A's scramjet scoops air from the atmosphere, making the aircraft lighter, allowing it to carry heavier payloads. The hydrogen-fueled aircraft has a wingspan of approximately 5 feet, measures 12 feet long and weighs about 2,800 pounds.

The first unpiloted X-43A and its Pegasus booster rocket will be air-launched from a B-52 from NASA's Dryden Flight Research Center. The booster will accelerate the X-43A to Mach 7 at approximately 95,000 feet. At booster burnout, the X-43 will separate and fly under its own power on a preprogrammed flight path.

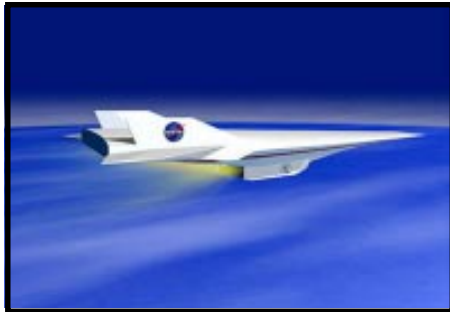
The NASA Hyper-X Program's development and flight testing of the X-43 vehicle is conducted jointly by Dryden and NASA's Langley Research Center. "After a successful X-43A mission, the 'brain trust' will exist to move forward with future propulsion-research vehicles that will ultimately result in more efficient space access vehicles" said Joel Sitz, Dryden's X-43 project manager.

"The Hyper-X program takes what we've been doing for the last 40 years in wind tunnel research to flight. Flight is reality," said Vince Rausch, Hyper-X program manager at Langley. "The program is structured around the scramjet engine and should be a major leap forward in the national capability for access to space. The country is

looking for safer, more flexible, less expensive ways to get to space, and that's what the scramjet engine would bring us."

Scramjet technology could also allow more traditional aircraft-like operations of launch vehicles, with horizontal take-off, landing and servicing, which could greatly reduce operational cost and time between flights.

Three X-43A flights are planned; the first two will fly at Mach 7 and the third at Mach 10. Each experimental aircraft



*Artist's Concept*

will fly once in the Naval Air Warfare Center Weapons Division Sea Range off the southern coast of California and impact into the Pacific Ocean.

Like the comparatively slower r a m j e t counterpart, the scramjet has a simple mechanical design with no moving parts. However, scramjet combustion occurs at supersonic air speeds in the engine. Rather than using a rotating compressor like a turbojet engine, the forward velocity and vehicle aerodynamic design compress air into the engine. There, fuel, usually hydrogen, is injected and the expanding hot gases from combustion accelerate the exhaust air and create thrust. In the case of X-43, the thrust will propel the vehicle at hypersonic speeds up to Mach 10.

Following the first series of X-43A hypersonic flights, the next step is an expanded hypersonics research ground and flight program currently in place as part of the Advanced Space Transportation Program, which is led by Marshall Space Flight Center.

The vehicle contractor team, led by MicroCraft in Tullahoma, TN, includes The Boeing Co., Seal Beach, CA, and GASL, Inc., Ronkonkoma, NY. The booster is a modified Pegasus rocket from Orbital Sciences Corp., Chandler, AZ.

Additional information is available on the Internet at:

<http://www.dfrc.nasa.gov/Projects/hyperx/x43.html>

<http://www.dfrc.nasa.gov/Projects/HyperX/index.html>

## ***Advanced Range Technology Initiative (ARTI) Engineers Host KSC Visitors***

The Advanced Range Technology Initiative (ARTI) was the subject of discussion when personnel from the NASA Kennedy Space Center recently visited the Wallops Flight Facility.

The meeting was a follow-up technical interchange meeting from the newly established Advanced Range Technology Working Group (ARTWG). The ARTWG, a collaborative NASA/USAir Force/Industry/Academia effort to focus interest and investment in Range Technologies, is co-chaired by NASA and the Air Force. NASA Wallops and the Virginia Spaceport Authority are members of the ARTWG.

During a day-long technical meeting, WFF and KSC participants worked to understand the scope and goals of each organization's ongoing range technology efforts. Presentations by Barton Bull, GN&C Systems Engineering Branch, on WFF GPS activities and by Dwayne Morgan, Real-Time Software Engineering Branch, on WFF prototype Flight Modem flight results were among the highlights of the day's events.

The group toured several Wallops areas including the launch range, the Integrated Control Center, the WFF mobile range which is being readied to support the Kodiak Star mission, and the NASROC fabrication and test laboratory (Building F-10).

Both groups acknowledged the need to partner on technology efforts where WFF and KSC have complimentary skills and expertise. Several candidate projects were identified, including an Autonomous Flight Termination System (AFTS), which will be the subject of technical meetings at Greenbelt in late April with the goal of identifying specific roles that Wallops engineers could fill on the KSC-led project.

Wallops' ARTI leadership extends its thanks to both the visitors and the Suborbital and Special Projects Directorate (Code 800) management team for their support of the meeting, for the openness of the dialog and the expressed willingness to collaborate in the Advanced Range Technology arena.

For further information visit the ARTI website: <http://www.wff.nasa.gov/~arti/>

## Wallops Shorts.....

### Ribbon Cutting



Caroline Massey, Management Operations Directorate, and Joe Duke, Suborbital and Special Orbital Projects Directorate, cut the ribbon officially opening the new Wallops Picnic Pavilion.

### Salisbury Zoo

Mike Savoy and Keith Koehler, PAO, participated in Earth Day activities at the Salisbury Zoo on April 21.

### Science Fair

John vanKleef, GHG, served as a judge for the Eastern Shore Science Fair held April 21 at the Eastern Shore Community College. Betty Flowers, PAO, also supported the event with an exhibit and Wallops information.

### Chuck Brodell Receives Award

Chuck Brodell, Shuttle Small Payloads Projects Office, was among 15 Goddard employees to receive the NASA Space Flight Awareness (SFA) award at a recent ceremony in Florida. The Space Flight Awareness award is the highest tribute paid by the SFA program to government and industry workers. Astronaut Janice Voss was present at the recognition ceremony.

### Retired

Congratulations to Bobby Nock who retired from the Balloon Program Office on April 3, 2001 with 35 years of government service.

### Earth Day

As part of Earth Day activities, 281 children from Snow Hill Elementary, Chincoteague Elementary Conservation Club and Kegotank Elementary School participated in a Grocery Bag project initiated by the Wallops Environmental Team and Occu-Health, Inc. Paper grocery bags were provided by Geoff's IGA, Snow Hill, MD; Parks Market, Chincoteague, VA; and Matthews Market, Mappsville, VA.

The students combined their knowledge of the local environment with art, computer, geography, math and science skills to decorate the bags that were placed in the stores to be used on Earth Day.

### NEBA Contacts

For information and assistance with NASA Employees Benefits Association (NEBA) life insurance, contact one of the following Wallops NEBA Chapter officers: Lisa Johnson, Chapter President, x1412, in Building E-105, Room 210, or Evoralyn Thomas, Chapter Vice President, x1054 in Building E-105, Room 311.

Space reserved for mailing labels.

### Space Academy Dates Set

The Virginia Space Flight Academy is a week-long residential camp at Wallops for students interested in learning about the science and engineering of rockets and space flight.

In its fourth year of operation, the Academy is offering five one-week camps in 2001. Four camps will be for students 12 to 14 years of age. The dates for these camps are: June 24 through 29; July 8 through 13; July 22 through 27; and August 5 through 10. An advanced camp is scheduled for August 12 through 17 for students ages 14 through 16.

The Academy is supported by NASA, the Virginia Space Flight Center, the Navy, NOAA and the Eastern Shore Regional Partnership.

More information on the Academy can be obtained at [www.vaspace.org/academy](http://www.vaspace.org/academy) or by calling 757-888-2055.

*Sympathy is extended  
to the family of  
Bob Duffy  
who died on April 3.  
Duffy worked at Wallops for  
41 years before retiring in 1993  
as Deputy Director of Suborbital  
Projects and Operations  
Directorate.*

### Exchange Store News

Effective immediately, the Exchange Store located in front of the Cafeteria (Bldg. E-2) will be open Monday - Friday from 10 a.m. - 2 p.m.

Stop by and check out our many new items, including Arcadia Publishing's recently released book, "Images of American - Wallops Island." Also just in time for summer fun, we have Captain Snap Frisbees designed especially for Wallops by Michael Conger, GHG, world class competitor and holder of numerous titles.

### Thrift Savings Plan Open Season

The next TSP Open Season is May 15 through July 31, 2001. Employees may enroll and change the amount of future contributions made through payroll deduction. Make changes through the Employee Express (EE). As cited in GSFC Announcement #01-15, there are new procedures for making open season changes.

For information on EE call (478) 757-3169 or 1-800-571-3453. The website is: <http://www.employeeexpress.gov>.

### System Safety Workshop May 1 - 3 8 a.m. to 4 p.m.

This course is offered at no cost to all NASA and contractor employees. Employees need to complete and submit the course registration form that requires a supervisor's signature.

Additional information and a course registration form can be found at: <http://www.wff.nasa.gov/~code803/pdf/syssafw01.pdf>

### Wallops Health Fair

Spring Into a healthy new you at the NASA Wallops Annual Health Fair scheduled for Thursday, May 3, from 10:30 a.m. to 1:30 p.m.

All civil service and contract employees, as well as their family members are welcome.

Topics will cover a wide variety of health and wellness issues, incorporating interactive demonstrations and screenings. The location will be announced closer to the date of the event. Contact the Health Unit on x1266 for additional information.

### Easter Egg Hunt



Despite the chilly breeze and threatening skies, Wallops annual Easter Egg Hunt was attended by approximately 90 children and 40 adults.

The winners, in their age categories, for the most candy found were: (front row, left to right) Ben Oneereonk, Seth Owens and Chelsea Townsend. (back row) D. J. Smack, Laura Truitt and Stacy Fox.

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<http://www.wff.nasa.gov>